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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,375	02/11/2004	Yoshiyuki Enomoto	09792909-5807	3926
26263	7590	11/14/2005	EXAMINER	
SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080			LOKE, STEVEN HO YIN	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/776,375

Applicant(s)

ENOMOTO, YOSHIYUKI

Examiner

Steven Loke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 August 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

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1. Claims 3-4 and 7-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification never discloses a surface of said first buried wiring is exposed to said dummy hole and the dummy hole is formed below said first buried wiring and has a diameter smaller than said contact hole as claimed in claim 3.

The specification never discloses a surface of said first buried wiring is exposed to said dummy hole and the dummy hole is formed below said first buried wiring and has a diameter smaller than said contact hole as claimed in claim 4.

2. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 9, the phrase "a wiring material" is unclear whether it is being referred to a wiring material similar to that of the contact hole in line 5 of claim 1.

Claim 2, lines 1-2, claim 3, lines 1-2, claim 5, lines 1-2, the phrase "said second buried wiring is formed as an upper layer of said first buried wiring" is unclear whether it is being referred to "said second buried wiring is formed over the first buried wiring".

Claim 4, lines 1-2, the phrase "said second buried wiring is formed as a lower layer of said first buried wiring" is unclear whether it is being referred to "said second buried wiring is formed under the first buried wiring".

Fig. 17 and pages 43-44 of the specification disclose the dummy hole [309] is partially filled with the wiring material and formed on the first buried wiring [305]. It is unclear why claims 1 and 5 disclose the dummy hole is filled with a wiring material when the dummy hole is formed over the first buried wiring.

Figs. 11 and 17 disclose the dummy holes [203, 309] are partially filled with wiring material. However, it is unclear why claims 7-9 and 11, 13 disclose the dummy hole is filled with the wiring material. The dummy hole would not cause a plugging failure when the dummy hole is filled with the wiring material.

Claim 6, lines 1-2, the phrase "said wiring material" is unclear as to which wiring material in claim 1 is it being referred to.

Claim 7-9, lines 2-3, the phrase "said wiring material" is unclear as to which wiring material in claim 1 are they being referred to.

Claim 10, lines 2-3, claim 11, lines 2-3, claim 13, lines 2-3, the phrase "a second buried wiring formed as an upper layer of said first buried wiring" is unclear whether it is being referred to "a second buried wiring formed over said first buried wiring".

Claim 10, line 13, the phrase "a wiring material" is unclear whether it is being referred to the wiring material in line 4 of claim 10.

Fig. 11 discloses the dummy hole [203] is partially filled with wiring material. However, it is unclear why claim 11 discloses the dummy hole is filled with the wiring material.

Claim 11, lines 7, 12, 14, the phrase "a wiring material" is unclear whether it is being referred to the wiring material in line 4 of claim 11.

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Claim 12, lines 2-3, the phrase "a second buried wiring formed as a lower layer of said first buried wiring" is unclear whether it is being referred to "a second buried wiring formed under said first buried wiring".

Claim 12, lines 7, 10, 13, the phrase "a wiring material" is unclear whether it is being referred to the wiring material in line 4 of claim 12.

Fig. 17 discloses the dummy hole [309] is partially filled with wiring material. However, it is unclear why claim 12 discloses the dummy hole is filled with the wiring material.

Fig. 17 and pages 43-44 of the specification disclose the dummy hole [309] is partially filled with the wiring material and formed on the first buried wiring [305]. It is unclear why claim 13 discloses the dummy hole is filled with a wiring material.

Claim 13, line 9, the phrase "a dummy pattern" is unclear as to what is it in the semiconductor device. Is it being referred to the dummy hole?

Claim 13, lines 7, 10, 14, the phrase "a wiring material" is unclear whether it is being referred to the wiring material in line 4 of claim 13.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 6 and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yang et al.

In regards to claim 1, Yang et al. show all the elements of the claimed invention in fig. 12. It is a semiconductor device, comprising: a first buried wiring [64]; a second buried wiring ([54] formed under the via [70]) formed as a layer different from said first buried wiring; a contact hole (the hole occupied by the via [70] above the middle portion of the layer [54]), which is formed between said first buried wiring [64] and said second buried wiring [54] and is filled with a wiring material [70] electrically connecting said first buried wiring and said second buried wiring therethrough; and a dummy hole (the hole occupied by the via [72]), which has a hole diameter different from that of said contact hole, is so formed in the vicinity of said contact hole so that a surface of said first buried wiring (the planar cross-section of layer [64] which is co-planar to the top surface of layer [58]) is exposed to said dummy hole, and is filled with a wiring material [72] therein.

In regards to claim 6, Yang et al. further disclose the wiring material [64] is made of copper.

In regards to claim 14, Yang et al. show all the elements of the claimed invention in fig. 12. It is a semiconductor device, comprising: a first buried wiring [64]; a second buried wiring ([54] formed under the via [70]) formed as a layer different from said first buried wiring; a contact hole (the hole occupied by the via [70] above the middle portion of the layer [54]) formed between said first buried wiring [64] and said second buried wiring [54] and is filled with a wiring material [70] for electrically connecting said first buried wiring and said second buried wiring therethrough; and a dummy hole (the hole occupied by the via [72]) formed in proximity to said contact hole and to have a hole

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diameter different from that of said contact hole so that a surface of said first buried wiring (the planar cross-section of layer [64] which is co-planar to the top surface of layer [58]) is exposed to said dummy hole, the dummy hole being filled with a wiring material [72] therein.

It is inherent that the dummy hole is operatively configured to inhibit a void from being generated in said contact hole when said first buried wiring is under stress because the large dummy hole absorbs all the stress from the first buried layer. Therefore, the stress to the contact hole is small and a void would not generated in the contact hole.

5. Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (571) 272-1657. The examiner can normally be reached on 8:20 am to 5:50 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sl

November 11, 2005

PAIR SYSTEM  
Steven Loh